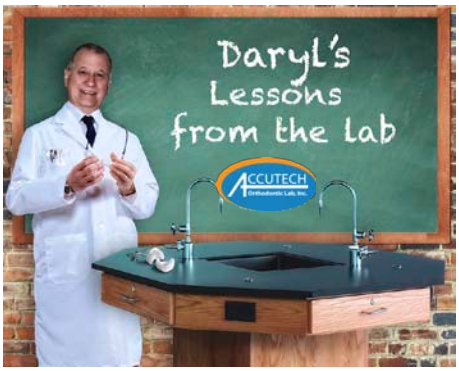
Hanks Herbst & Distal Jet



The Herbst Appliance is a functional appliance that was designed for the non-compliant patient. Although it was invented almost a century ago, until recent years the original design has changed very little. The mandible is held in a protrusive position by means of a tube that is affixed to a pivot, which is located on a band or crown on the maxillary first molars. A rod fits into this tube and is attached to another pivot located on a band or crown on the mandibular first or second bicuspids. The patient can open and close their jaws, but the rod and tube mechanism prevents the mandible from moving back into its normal position. By holding it in this advanced position, the growth of an underdeveloped mandible is enhanced, thereby helping to improve facial contours and treat a Class II molar relationship.

Design innovations have come with the recent increase in popularity of the Herbst Appliance among orthodontists. One major difficulty in prescribing a Herbst has been that the patient needed to have fully erupted mandibular bicuspids in order to place bands or crowns for the lower pivots. This limited the ability to place the appliance during the ideal growth period that coincides with mixed dentition. The cantilever design was developed as an alternative to fixing the lower pivots to the mandibular bicuspids. A band or crown is placed on the mandibular first molars and a cantilever arm (metal bar) extends anteriorly to the bicuspid region. The pivot is then affixed to the anterior end of the cantilever arm where the rod portion of the assembly is attached.

Another problem that orthodontists faced had to do with the tube and rod assembly. If the patient opened their mouth wide enough, the rod would sometimes come completely out of the tube. In an attempt to prevent this from happening, labs began making the rods longer. This caused a different problem. When the patient's jaws were closed, the end of the rod would extend distally out of the tube and rub against the superior aspect of the mandible due to the advanced position the appliance was designed to maintain. As a result, many patients developed painful ulcers in this area.

One of the biggest flaws with the traditional design had to do with the limited range of motion that patients had when moving the mandible laterally. Each tube and rod had a metal loop at one end, where the part attached to the pivots on the bands or crowns. The loop fit over the pivot and a screw fit through the loop and into a threaded hole in the pivot. This worked well for opening and closing the mandible, but when moving laterally the appliance tended to bind and often broke as a result of the forces exerted upon it.

Hanks Herbst: Dr. Stephen Hanks favored the Herbst appliance in his treatment planning, but wished to improve upon these problem areas. He designed a telescoping Herbst that replaced the two-piece tube and rod assembly with a one-piece telescoping arm. This allows patients to open their mouth as wide as possible without causing the appliance to come apart. The design eliminated the problem of painful ulcers caused by the rod rubbing against the superior aspect of the mandible. Dr. Hanks also replaced the traditional style pivots with a ball and socket joint, which allows the patients a much greater range of lateral motion. When the cantilever design is being utilized, the Hanks Telescoping Herbst has an accessory, which features a one-piece cantilever arm with a built-in threaded end. It eliminates the need for welding and soldering these parts in the lab. Dr. Hanks' innovations have improved patient comfort, reduced the likelihood of appliance breakage, made appliance insertion easier for the clinician and made the Herbst appliance easier for the lab to fabricate.

Hanks Telescoping Herbst

Distal Jet: Many appliances have been developed for the purpose of distalizing the maxillary molars in order to gain space for crowded and erupting teeth and to correct a Class II molar relationship. In recent years, the focus has been on non-compliant patient designs that actively apply force to the molars without relying on the patient to wear the appliance or activate any parts. Among these designs, the Distal Jet has become one of the most popular and effective.

The Distal Jet uses compressed super-elastic coil springs to apply a constant distalizing force to the molars. The appliance is anchored against the palate with a Nance-type acrylic button and is fixed in place by either bonding it to the occlusal surface of the premolars or bicuspids, or by soldering it to bands on these same teeth. Lengths of tubing extend distally out of the acrylic button on both sides of the arch toward the molars. Pieces of .036 wire fit into the tubing on one end and into lingual sheaths on the first molar bands on the other end. A locking mechanism slides over the tubes and a length of coil spring is fitted over the .036 wires. The orthodontist can slide the mechanism distally by loosening an Allen screw in the locking mechanism and compressing the coil spring. The Allen screw is then tightened in the new position, which keeps the coil spring compressed and causes it to direct a distalizing force against the molars. The patient must return for a follow-up appointment every 3-4 weeks at which time the orthodontist repeats the process of adjusting the locking mechanism to recompress the coil spring. This regimen is continued until the desired amount of space has been created to accomplish the treatment goals, typically 3-6 months. The appliance can then be converted to a passive holding appliance similar to a Nance by removing the coil springs and cutting the wires free of the premolars or bicuspids, thus saving the time and expense of having to order and fit a separate appliance.

Distal Jet